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SCHEDULE OF MEETINGS

10-15 December	**Expert Committee on Mental Health, Geneva**
10-15 December	**Expert Committee on Health Statistics, Geneva**
7-12 January	**Standing Committee of the Executive Board on Administration and Finance, Geneva**
14-20 January	**WHO Tuberculosis Workers' Conference, New Delhi**
15-26 January *	**Nineteenth session of the Executive Board, Geneva**
21-26 January	**Seminar on Application of International Sanitary Regulations, Maracay**
31 March-13 April	**Regional Training Course on Rabies, Caracas**
7 May-24 May *	**Tenth World Health Assembly, Geneva**
27-31 May *	**Twentieth session of the Executive Board, Geneva**

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RESISTANCE OF INSECTS TO INSECTICIDES

The number of insect species of public health importance which have given evidence of resistance to insecticides has continued to rise in recent years and the total may now be taken as 37, in comparison with 13 species in 1950 and only one in 1946. This rise was remarked on in the report issued after the conclusion of the seventh session of the Expert Committee on Insecticides which was held in Geneva between 10 and 17 July 1956. Events, indeed, have confirmed the fears felt by members of the WHO Symposium held in Rome in October 1953 [1] that vector control was threatened by the development of resistance.

Resistance in *Anopheles* mosquitos

The Symposium's 1953 report stated that " among malaria vectors, resistance has not so far developed to the point of compromising the success of control measures ". The Expert Committee's 1956 report says: " a definite physiological resistance now exists locally in at least four species of *Anopheles*." At the present time *A. sundaicus* can no longer be controlled with DDT at points along the north coast of Java, and the spraying programme is therefore based on dieldrin. In Greece, the control of *A. sacharovi* in houses by DDT is now ineffective, and the resistance also extends to BHC and chlordane. DDT-resistance has appeared in *A. stephensi* on the Persian Gulf coast of Saudi Arabia. Fourthly, a population of *A. gambiae* in northern Nigeria has been discovered to be resistant to dieldrin; on laboratory study this resistance is approximately 800 times the normal. It should be added that *A. quadrimaculatus*, which had formerly shown only a slight decrease in DDT-susceptibility, has shown dieldrin-resistance in Mississippi, USA.

Resistance in *Aëdes* and *Culex*

Recently it has been found that larvae of *Aëdes aegypti* in Trinidad are now a thousand times as resistant to DDT as a typical normal laboratory population of *A. aegypti*. Reports are being received that control with DDT is failing in certain other Caribbean islands and in parts of Venezuela. The resistance of the salt-marsh *Aëdes* of Florida and the irrigation-water *Aëdes* of California have rendered obsolete the use of any chlorinated hydrocarbon insecticide for larvae control.

The main encephalitis vector of California, *Culex tarsalis*, is similarly resistant. Valid quantitative evidence of the acquisition of DDT-resistance by adults of *C. quinquefasciatus (C. fatigans)* has come from Réunion and from Delhi, India, while its resistance to control has been reported from five South American countries. Larvae of *C. fatigans* in Georgetown, Malaya, are resistant to BHC. The common house mosquito, *C. pipiens*, now shows resistance to larval control by DDT in parts of the USA, recalling the adult resistance of *C. molestus* discovered in Latina, Italy, in 1947.

Resistance in *Pediculus* and *Pulex*

In the last report in the *Chronicle*,[2] the appearance of DDT-resistant body-lice in Korea and Egypt was noted. Since that time WHO has been conducting a world-wide survey of resistance in lice by means of special

[1] See *Chron. Wld Hlth Org.*, 1954, 8, 3.

[2] *Chron. Wld Hlth. Org.*, 1954, 8, 3

These houseflies (Musca domestica) *were killed by 10 mg of DDT in 6-8 hours. But, as is pointed out in this article, DDT now has little effect on* Musca domestica *in certain areas of the world.*

test kits. A high degree of resistance to DDT has been discovered in two towns of South Africa, in Hong Kong, and in most regions of Japan. Resistance greater than that found in Egypt was found to be present in Iran, Turkey, Syria, Jordan, Peru, and Chile, and in a broad band extending across the continent of Africa from Ethiopia to Senegal.

Resistance of *Pulex irritans* to control by DDT has evidently developed in the east Mediterranean and central South American regions, but quantitative evidence is still awaited. *Ctenocephalides* fleas have also become DDT-tolerant in southern USA and northern South America. The evidence on *Xenopsylla cheopis* is still inconclusive.

Resistance in other insects of public health interest

Instances of resistance to DDT by the bedbug *Cimex lectularius*, with varying degrees of proof, have come from all over the world, i.e. Hawaii, USA, Congo, Italy, Greece, Lebanon, Israel, Iran, India and China. A similar resistance has been confirmed for *C. hemipterus* in Taiwan.

The cockroach *Blattella germanica* is now resistant to chlordane in many cities of the USA, necessitating the return to pyrethrins for control; but two cases of pyrethrin-resistance have now appeared.

With the housefly *Musca domestica*, the interest has now changed to places where it is not resistant to chlorinated hydrocarbons: Japan, Korea, the United Kingdom and southern Germany seem to qualify in this regard, and so do India and Ceylon where *M. nebulo* is the predominant species. Elsewhere the use of these insecticides for the control of flies and flyborne diseases is now being abandoned.

ROLE OF WHO IN THE EMERGENCY

The Expert Committee on Insecticides, noting that the problem of resistance is growing more rapidly than are measures to deal with it, recommended that WHO assume leadership in the stimulation and co-ordination of an international research programme. Among its more important activities should be included: (a) the collection and dissemination of information on the problem, (b) the

promotion of needed research, and (c) the facilitation of the procurement of personnel and funds. The Committee also recommended that WHO set up standard tests for insecticide susceptibility and promote their use, so that resistance may be detected as it appears.

Accordingly, WHO is in process of setting up standard tests for the susceptibility of adult and of larval mosquitos to chlorinated hydrocarbon insecticides, and has refined its present test for the susceptibility of *Pediculus*. It is promoting a number of research projects by means of grants, and is drawing the attention of other granting agencies to deserving proposals for study. Regional and Headquarters symposia on the subject are planned. A bimonthly information circular on the resistance problem is being distributed to research workers in the field. A Headquarters post of scientist (biologist) [3] has been created for full-time attention to matters of insecticide resistance.

Pattern of resistance

It is now recognized that there are two main types of resistance in the housefly: one to DDT and its analogues; and the other to dieldrin, chlordane and other cyclodiene compounds, as well as to gamma-BHC. Recent studies on cross-resistance show this to be the case in other disease vectors. The DDT-resistant *Anopheles sundaicus* and *A. stephensi* are of normal susceptibility to gamma-BHC and the cyclodiene compounds. The dieldrin-resistant *A. gambiae* and *A. quadrimaculatus* are resistant also to gamma-BHC but normally susceptible to DDT. The DDT-resistant *Culex molestus* adults were controlled by chlordane or BHC, but the BHC-resistant *C. fatigans* larvae were controlled by DDT. The DDT-resistant *Aëdes aegypti* are susceptible to gamma-BHC and the cyclodiene compounds.

[3] At present held by Professor A. W. A. Brown, on leave of absence from the University of Western Ontario

DDT-resistant *Pediculus*, too, are found to be susceptible to BHC almost everywhere except in Japan. The chlordane-resistant *Blattella* showed little increase in resistance to DDT.

On the other hand, resistance to virtually all chlorinated hydrocarbon insecticides is shown by the salt-marsh *Aëdes* of Florida, the irrigation-water *Aëdes* and *Culex* of California, *Anopheles sacharovi* in Greece, and probably by the *Ctenocephalides* fleas in southern USA.

Physiology of resistance

Research during the last few years has indicated that the main cause of DDT-resistance in the housefly is an increased rate of detoxification. Houseflies resistant to DDT dehydrochlorinate this insecticide to DDE; in general, the more resistant the strain or individual, the greater the DDE production. Species of insects which are normally refractory to DDT can also detoxify DDT, while normal susceptible houseflies produce only a small amount of DDE. This conversion is brought about by an enzyme called DDT-dehydrochlorinase, which can be isolated and which when activated by glutathione can produce DDE in vitro.

Other factors besides dehydrochlorination may be involved in resistant strains, such as a heavier cuticle, a reduced rate of absorption of DDT, a higher content of Fe or cytochrome oxidase, or a greater amount of fat. Present evidence indicates that they are secondary, although matters are not yet closed.

DDT-resistance in *Aëdes aegypti* has been found to be associated with DDE production in vivo, but not in vitro. The same occurs in an induced DDT-resistant strain of *Blattella*. Resistant *Pediculus* contain a DDT-dehydrochlorinating enzyme, but so do the normal lice.

BHC-resistance in the housefly has been found to be associated both with a decreased

absorption of the toxin and an increased rate of detoxification. Nothing is yet known of the physiological mechanism of dieldrin-resistance, nor indeed of dieldrin-susceptibility.

Genetics of resistance

Until recently it was considered that DDT-resistance in the housefly was due to the accumulated action of a number of genes. But with the recent application of better genetical techniques it has become evident that it is due primarily to a single gene in a given strain. A different gene is responsible for BHC and chlordane-resistance.

The dieldrin-resistance of *A. gambiae* in northern Nigeria has been very promptly and definitely shown to be due to a single gene. The three possible genotypes—resistant homozygotes, intermediate heterozygotes and susceptible homozygotes—may be identified in a population by toxicological test, the first genotype being 800 times as resistant as the last.

Evidently these specific genes for resistance are already present in the population in low frequency, awaiting the insecticide to increase their frequency by selection. They are not induced by the insecticide: DDT, for example, is not mutagenic. Nor can inheritable DDT-resistance be induced in a fly by exposing it to sub-lethal doses of DDT; it can only be induced in a population by exposure of them all to a dose which kills some of them.

If a resistant population is genetically homogeneous, its resistance will persist in the absence of the insecticide. DDT-resistant laboratory strains may retain their resistance for many generations when released from DDT pressure. Field-collected strains when taken into the laboratory may revert quite quickly, being heterogeneous genetically. Discontinuation of the use of an insecticide in the field is generally followed by a decrease in resistance, caused by interbreeding with unselected flies, but resumption of use of the insecticide may bring the resistance back very quickly.

The genetical basis for this phenomenon is probably that in achieving resistance the housefly must have not only the main gene for DDT-resistance but also a number of secondary or satellite gene alleles concerned with vigour, or at least the absence of deleterious alleles that may at first have been linked with the main gene. In some instances, such secondary genes can be accumulated in the absence of the main gene and confer a degree of tolerance to the insecticide, and indeed to other environmental stresses. Their accumulation may be promoted not only by pressure from the insecticide but also by other environmental stresses. This acquisition has been called " vigor tolerance "; it is not associated with specific detoxification and involves typically a slight increase in resistance.

ALTERNATIVE INSECTICIDES

DDT-resistance can sometimes readily be countered by substituting another insecticide. This has been successfully done with dieldrin for control of *A. sundaicus* in Java, and with BHC for control of *Pediculus* in Korea and elsewhere. But these insecticides are chlorinated hydrocarbons also, and it is known that DDT-resistant houseflies extend their resistance to BHC and dieldrin very readily. The substitution of pyrethrins is better in this regard, and this has been occasionally done with DDT-resistant *Musca* and *Pediculus*. It was also considered the answer to chlordane-resistance in cockroaches, but pyrethrin-resistant *Blattella* have now developed.

A search has been made for synergists that may reactivate DDT so that control of resistant strains may be regained. DMC and piperonyl butoxide, for example, have this effect since they inhibit the detoxification of

DDT to DDE in the resistant housefly. DDT-synergist mixtures have given disappointing results in the field, and laboratory evidence indicates that the housefly can go on to develop resistance to the mixtures.

A more radical alternative in insecticides is offered by the organo-phosphorous compounds; the Symposium's report in fact noted that "insects have not developed resistance to these substances". And so this change has been made both for adult housefly control in the USA and Denmark, and also for larval culicines in California and Florida. But the housefly has now developed resistance to parathion, diazinon and resitox in Denmark, and to malathion and dipterex in parts of Florida. Laboratory selection has increased the resistance of *Musca* to parathion, malathion, diazinon and chlorthion by amounts of the order of 20 times. The possibility of resistance of *Culex tarsalis* larvae to malathion is now under study.

It is not yet known whether this resistance to organo-phosphorous compounds is any more than "vigor tolerance", although in Denmark it is enough to inhibit control. Although at present these compounds are in general more expensive, more hazardous to apply, and less persistent in their residual activity, yet such a wide variety of them is becoming available that it is possible that certain compounds and formulations will prove practical. It is also considered that the effectiveness of mixtures of organo-phosphorous compounds with chlorinated hydrocarbons should be investigated.

FUTURE OUTLOOK

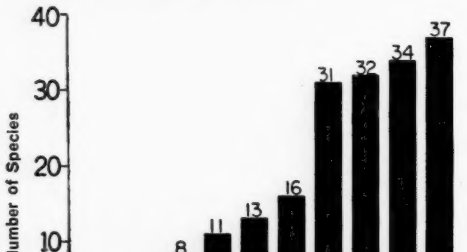
The report of the Expert Committee on Insecticides did not imply that a single "answer" to resistance is expected, but rather that practical countermeasures demand an increase in knowledge on many fronts. The resistance problem is after all a collection of individual cases differing in species, insecticide and locality, each demanding its own solution. One common factor underlies the entire problem, namely, the induced evolution of the insect by the selective action of the insecticide, and if the conditions are right the acquisition of resistance is inexorable.

Among the conditions favouring the development of resistance, the following four can be mentioned: (1) the species concerned being constitutionally able to develop resistance by containing the necessary genes somewhere in its population; (2) the persistence of insecticide deposits which have decayed to a level which kills only a proportion of the insects; (3) the exposure of larvae as well as adults to the same insecticide; (4) the involvement of the greater part of the field population in the insecticide application. Laboratory studies now in progress are investigating the first and the third of these points, as they concern certain anopheline vectors; a standard bioassay test will be developed by WHO to shed some light on the second point; the Expert Committee particularly recommended the type of ecological observations that might elucidate the fourth point.

There is a feeling in public health circles that time is running out in the use of insecticides for vector control, and that the present point of vantage must be exploited to the full before it is generally negated by resistance. Therefore the short-term countermeasure is to have substitute insecticides of proven effectiveness ready to be thrown into the breach immediately resistance appears in disease (e.g. malaria) and vector (e.g. *A. aegypti*) eradication programmes. The long-term aim is to recommend such control measures as will delay as long as possible the development of resistance in vectors (e.g. *Pediculus*, *Pulex*) whose need for control is continuous, so that there always remain some insecticides available to which resistance has not yet extended.

There is an urgent and vital need for fundamental research on the physiology of

CUMULATIVE NUMBER OF INSECTS OF PUBLIC HEALTH IMPORTANCE RESISTANT TO INSECTICIDES (1946-1955) *



* From Quarteman and Schoof, *Amer. J. trop. Med.* (in press).

resistance, for genetical studies on laboratory strains and field populations of vector insects, and for the development and evaluation of new insecticides and formulations, as an addition to the stock of knowledge on the problem. It is equally important that public health workers be kept informed of the current situation as it concerns their own areas, not only by periodically testing the susceptibility of their own vectors and being on the alert for any failure in control, but also by the receipt of a free flow of information on the resistance problem promptly transmitted to them by WHO. Only well-informed personnel can display the flexibility and resourcefulness necessary to cope with the resistance problem.

ACCIDENT PREVENTION IN THE HOME

The steady decrease in the death-rate from common infectious diseases during the past twenty years has had the effect of throwing into sharp relief the urgent problem of accidents in the home. As infectious disease deaths have fallen so accident rates have risen. The year 1900, for example, saw 43 000 deaths in England and Wales from measles, whooping cough, diphtheria, typhoid and scarlet fever, while fatal accidents only accounted for 14 200 deaths. But in 1954 the same infectious diseases were only responsible for 229 deaths yet the number of accidental deaths had risen to almost 21 000.

This alarming present-day home accident rate, particularly among children and elderly people, was the technical discussion subject at the Regional Committee for Europe's sixth session held in Geneva between 10 and 13 September 1956. In the course of the discussions many aspects of accident prevention were considered, and members of the Committee brought forward figures from their own countries to illustrate the extent and gravity of the problem, and to demonstrate the need for further investigations. The summary report on the technical discussion, prepared by Professor James M. Mackintosh, underlines the acute need for further preventive measures.

Increasing mechanization raises accident rates

Technical advances, leading to increasing mechanization in the home, have raised many new hazards in domestic life. The report shows, for example, that out of the daily 44 accidental deaths occurring in Italy no fewer than 17 take place in the home. Similar figures emerge from studies made in Great Britain where, out of the 45 daily accidental deaths 24 occur in and around the home. Much the same thing is true in Sweden where available statistics show that the victims of accidents are usually older people over the age of 65.

Quite apart from the technical advances in the home, changing patterns of living have increased the difficulties of home care, especially for the very young and the very old.

Accident frequency is most marked in the over sixty and under five age-groups. The age-group two to five is particularly vulnerable because the child at that time is lively, curious, and inexperienced. Children of this age are liable to burns, scalds and injury by corrosive liquids. They are prone to fall into water and drown.

Elderly people by contrast suffer most frequently from accidents due to stumbling, slipping or falling. Accidents of this type, due in many instances to failing sight or unsteady gait, result in head injuries or limb fractures. With people of this age comparatively slight injury may lead to serious consequences.

Accident study and investigation

It has frequently been suggested that serious injuries outnumber deaths from accidents by a hundred times or even more. Available statistics deal almost exclusively with fatal accidents by reason of the fact that these are generally recorded in public documents. A few countries have, however, been able to promote intensive studies in morbidity. In Yugoslavia, a study of accidents in and around the home has been in progress since 1954. Mass investigations of a similar kind are being conducted at Newcastle-upon-Tyne where one thousand families are having their accident case histories followed up over a period of seven years. The first five-year period has been completed and much useful evidence obtained.

Mass studies of a similar pattern are being undertaken in Denmark. In Copenhagen a medical research worker is visiting families and collecting accident facts. However, apart from mass studies of the type mentioned above several specialized studies have also been completed. In the Netherlands, for example, an investigation was made in 1955 of all children admitted to hospital as a result of accidental injury. Altogether 632 cases were carefully investigated. Results showed that falls accounted for a higher figure of casualties than traffic. Defective housing was the major factor causing home accidents.

A new study of the school problem is being made in two large Italian cities in order to determine the accident factors. From a total of 50 000 accident cases reported and treated in hospitals over a period of five years the number of fatalities was small, but 80% of the non-fatal accidents led to permanent incapacity. A number of studies have also been carried out on an intensive scale in three hospitals in Zagreb, Yugoslavia. Of the total number of patients admitted, injuries due to accidents in the home amounted to 802 (45.4%). No fewer than 484 were children under the age of 14.

Methods of accident prevention

Following discussions on the whole question of accident prevention participants in the debate laid particular stress on the following approaches to preventive work: the need for more intensive study of non-fatal accidents through mass studies of unselected populations over a period of years, or specialized studies of limited age-groups or specific types of accidents; actual safety and preventive measures; education of children and parents to make them accident conscious. Among the preventive measures referred to by the Committee were the safe structural design of homes and their equipment, particularly electrical fittings, fires and other forms of heat. Primary measures included the design of safe toys, and the protection of children and elderly people from dangerous drugs and corrosive liquids.

Finally, considerable emphasis was placed on the importance of education as the greatest single measure in the prevention of

accidents. It was felt that the careful training of children at home and in the school, and especially giving them a sense of responsibility for their own safety, would lead to progress in accident prevention. Education likewise comprised the imaginative training of teachers and parents through every suitable media of publicity.

VIRUS LABORATORIES: PROBLEMS AND NEEDS

The need for virus-diagnostic laboratories, preferably affiliated with or representing an integral part of existing bacteriological laboratories, provided the central theme for a WHO-sponsored seminar on the public health aspects of virus and rickettsial diseases which was held in Madrid between 16 and 25 April 1956. The general aim of the seminar lay in bringing before governments the need for the establishment and development of virus diagnostic facilities in their respective areas. Linked with this purpose was the obvious desirability of providing information and orientation on well established and new methods of diagnostic theorology; also of promoting the integration of virus diagnostic activities with existing bacteriological facilities, emphasis being placed on the fact that elaborate installations were unnecessary and that relatively small additions to existing facilities would enable a useful service to be provided.

The seminar was conducted in co-operation with Dr Pérez Gallardo and the technical staff of the National School of Public Health in Madrid. Planning and organization was carried out by Regional Office for Europe in consultation with WHO Headquarters, and with the assistance of a special consultant, Dr Michael M. Siegel, Associate Professor of Bacteriology at the University of Miami.

Present problems and future needs

Arising from the comments made during the course of discussion sessions it was apparent that the problems and needs of different countries varied considerably. Even the very general question of the location and number of the laboratories was approached differently. However, one problem which was common to all countries was the universal shortage of qualified personnel for virus laboratories. This applied equally to availability and to training possibilities for virologists and technical personnel.

The most acute problem, however, in the development of virus diagnostic activities was the availability of diagnostic reagents. Participants were unanimous in their concern regarding the lack of diagnostic antigens and particularly antisera. The same difficulty also applied for tissue cultures. It was felt that steps should be taken by WHO to provide or help in obtaining diagnostic reagents, although WHO action on this matter would have to depend on the availability of funds. WHO had already made available reagents for the diagnosis of influenza to the WHO Influenza Centres and has planned a similar system of distribution under the co-ordinated poliomyelitis programme.

Another problem which received considerable attention was that of laboratory infections. Safety devices and vaccination against the agents used in laboratories were both brought up as useful measures, but discussion underlined the fact that there was no substitute for care, caution and common sense in the avoidance of infection.

Looking to the future the seminar dis-

Although in this photograph suspected fever patients are going into the Sangre Grande virus laboratory in Trinidad for examination, the principal work of this field laboratory is rather different. It is engaged primarily in trapping monkeys and rodents for use in research on wild viruses circulating in the blood stream of forest animals.

cussions stressed that if progress were to be ensured in the field of virus diagnostic work, there should be a two-way exchange of specimens, materials, and ideas between the routine virus laboratories and such other institutions as reference laboratories, university centres, and contagious diseases hospitals. A different aspect of exchange of information lay in the need for virologists to assist clinicians and public health officers by means of consultation and advice. Such a service would, of course, require basic education of the virologist in the general field of medicine.

Success of virus laboratories depends to a large extent on the degree to which national governments understand and appreciate the need to support them, and the major role which they play in preventive medicine and diagnostic service. Additional research along applied lines is most certainly of the greatest importance, and it is evident that at the present stage of virology, a public health virus diagnostic laboratory can only render satisfactory service if it is able to devote a reasonable part of its work to research.

During the course of the seminar the tests which were discussed were illustrated in

laboratory sessions at which the participants in groups conducted the tests. These included the isolation and identification of unknown viruses. The other tests and discussions covered a wide variety of virus diseases such as rabies, smallpox, poliomyelitis, influenza, mumps, various forms of encephalitis and aseptic meningitis, psittacosis, as well as rickettsial diseases such as typhus and Q fever.

SOME ASPECTS OF CANCER IN FEMALES

Certain significant facts bearing on the large increase of deaths caused by cancer of the breast, and on trends of mortality from cancer of the female genital organs are revealed in a recent WHO epidemiological study.[1] The author reviews the mortality statistics in women from cancer of the breast, the uterus, and other female genital organs for 19 countries over the years 1920-53, first considering the general trend of the mortality series for each group of diseases for all ages and then analysing in each sector of mortality the changes which have occurred in the age-specific death rates in some crucial years during the same period.

Mortality from cancer of the breast has increased over the period studied (see Table I) by over 100 per cent. in Denmark, Italy, Norway, Netherlands, Sweden, Union of South Africa, Chile, Australia and New Zealand, and by over 50 per cent. in England and Wales, Scotland, Ireland, Switzerland and the United States of America. In Japan, on the other hand, the death-rates appear remarkably low.

Analysis of mortality from cancer of the breast according to age shows that under 25 years this cause of death is usually insignificant, but that there is a rapid rise thereafter. The death-rate from this cause among persons 75 years old and over is usually more than three times that for persons aged 45-54 years and twice that for the 55-64-year age-group. There are also wide differences in the levels of specific death-rates for corresponding age strata among the various countries. Thus, while for women 45 to 55 years old the death-rate is usually around 53 per 100 000 women in England and Wales, it is about 43 in Ireland and Australia, and less than 10 in Japan.

Mortality from cancer of the uterus has shown a very different trend over the period studied, either having remained more or less stationary or—as is the case in England and Wales, Scotland, Switzerland, and the USA—showing a decrease in recent years. The specific mortality increases with age, generally reaching the maximum in the highest age groups; in Japan, however, the maximum is reached at 55-64 years.

Cancer of other female genital organs has shown a decided upward trend in most countries, and, in some, there are considerable differences between the figures for this type of cancer from this cause and those for cancer of the uterus.

To complete this study, there are notes on the interpretation and completeness of the data, and the relative influence of the age structure of the population and of the different levels of mortality at different ages is tested for certain countries.

[1] Pascua, M., *Bull. Wld Hlth Org.*, 1956, 15, 5 ("Trends of Female Mortality from Cancer of the Breast and Cancer of the Genital Organs")

TABLE I. DEATH-RATE FROM CANCER OF THE BREAST, PER 100 000 FEMALES, BY YEAR

Year	England and Wales	Denmark	Scotland	Spain	Finland	France	Ireland (Republic)
1920	22.8	12.7	19.5	4.6	.	.	.
1921	23.6	15.7	20.7	4.5	.	.	.
1922	24.2	18.2	21.2	4.2	.	.	11.5
1923	24.9	16.5	21.3	4.5	.	.	15.6
1924	25.5	17.9	22.9	4.5	.	.	14.8
1920-24	**24.2**	**16.2**	**21.1**	**4.5**			**14.0***
1925	26.5	17.6	22.4	4.5	.	.	14.7
1926	26.0	17.6	21.8	5.4	.	.	17.2
1927	27.7	17.9	24.2	5.5	.	.	16.1
1928	28.5	18.2	23.2	5.8	.	.	16.5
1929	28.8	20.2	24.0	5.0	.	.	16.3
1925-29	**27.5**	**18.3**	**23.1**	**5.2**			**16.2**
1930	29.2	18.3	23.4	5.4	.	.	18.0
1931	28.8	18.4	25.3	5.6	.	.	16.9
1932	28.7	21.0	24.9	5.1	.	.	16.5
1933	29.4	21.8	24.1	5.3	.	.	15.1
1934	29.9	22.3	27.0	5.3	.	.	16.7
1930-34	**29.2**	**20.4**	**24.9**	**5.1**			**16.6**
1935	30.1	24.2	25.5	5.7	.	.	17.8
1936	31.3	23.7	27.0	4.9	10.0	.	19.5
1937	30.5	24.1	26.0	5.3	9.5	.	17.8
1938	31.6	24.4	29.8	5.1	9.2	.	18.9
1939	32.4	24.2	27.3	5.6	9.8	.	18.9
1935-39	**31.2**	**24.1**	**27.1**	**5.3**	**9.6**		**18.6**
1940	32.6	25.4	27.5	5.4	8.8	.	19.6
1941	32.2	26.0	27.3	5.7	10.0	.	20.2
1942	33.2	25.8	26.9	5.5	9.5	.	18.6
1943	33.5	25.4	30.1	5.3	10.0	17.3	21.5
1944	33.2	26.5	29.4	5.6	10.3	17.4	21.5
1940-44	**32.9**	**25.8**	**28.2**	**5.5**	**9.7**	**17.3***	**20.3**
1945	33.0	28.9	30.0	5.7	11.7	16.3	18.3
1946	35.0	29.4	26.2	5.5	10.9	16.2	22.5
1947	34.8	28.6	28.6	5.2	9.5	16.6	18.5
1948	35.0	27.0	29.0	5.7	11.1	17.9	23.1
1949	34.9	28.3	30.8	5.7	12.0	18.6	22.7
1945-49	**34.5**	**28.4**	**28.9**	**5.6**	**11.0**	**17.1**	**21.0**
1950	35.0	31.8	30.7	6.0	12.5	20.1	21.4
1951	35.2	31.4	30.0	.	11.7	20.9	21.5
1952	36.3	31.3	30.8	.	11.9	21.4	22.5
1950-52	**35.5**	**31.5**	**30.5**	**6.0**	**12.0**	**20.8**	**21.8**
1953	35.7	32.0	30.8	6.2	12.4	21.8*	23.8

. Information either non-existent or not available * Provisional

TABLE I. DEATH-RATE FROM CANCER OF THE BREAST, PER 100 000 FEMALES, BY YEAR (continued)

Year	Italy	Norway	Netherlands	Sweden	Switzerland	Union of South Africa
1920	5.7	10.2	12.1	.	17.4	8.5
1921	5.9	9.7	13.6	9.9	15.7	7.9
1922	5.6	9.9	12.9	10.1	17.9	11.0
1923	5.9	10.8	14.4	11.6	18.6	10.9
1924	8.7	10.1	14.7	11.7	18.8	11.7
1920-24	**6.4**	**10.1**	**13.5**	**10.8***	**17.7**	**10.0**
1925	8.1	11.3	15.7	12.6	19.5	14.2
1926	6.8	10.3	17.4	12.1	21.2	13.7
1927	7.5	11.3	17.9	12.7	21.2	14.6
1928	7.7	12.9	18.2	12.8	20.1	13.9
1929	8.1	12.7	19.1	13.9	18.9	12.8
1925-29	**7.6**	**11.7**	**17.7**	**12.8**	**20.2**	**13.8**
1930	8.7	14.5	19.4	15.5	21.1	18.3
1931	9.0	13.7	20.1	14.2	20.9	16.0
1932	9.5	13.8	19.8	15.7	22.1	15.1
1933	9.7	14.6	20.9	14.6	23.1	18.3
1934	10.1	16.7	20.4	15.7	23.7	15.7
1930-34	**9.4**	**14.7**	**20.1**	**15.1**	**22.2**	**16.7**
1935	11.1	15.4	20.5	15.8	20.9	17.5
1936	11.0	14.0	23.2	17.8	23.3	22.2
1937	11.6	17.4	23.4	18.6	23.9	21.2
1938	11.9	15.5	25.1	19.4	25.7	18.0
1939	11.9	18.1	23.8	18.3	26.5	20.7
1935-39	**11.5**	**16.1**	**23.8**	**18.0**	**24.1**	**19.9**
1940	11.6	18.3	23.7	19.5	25.2	.
1941	11.5	18.9	25.1	19.6	27.0	.
1942	12.0	18.1	24.0	19.9	24.3	.
1943	10.9	16.9	24.2	21.3	27.9	.
1944	10.9	17.4	24.0	20.7	27.4	.
1940-44	**11.4**	**17.9**	**24.2**	**20.2**	**26.4**	
1945	11.6	18.0	23.4	21.6	30.3	.
1946	11.0	16.2	24.4	22.5	28.8	16.9
1947	13.2	18.1	24.0	22.2	27.4	18.4
1948	13.4	19.0	24.3	23.3	30.4	16.9
1949	13.9	22.5	25.7	22.9	31.3	20.3
1945-49	**12.6**	**18.8**	**24.4**	**22.5**	**29.6**	**18.1***
1950	14.4	21.3	25.3	22.7	29.4	20.8
1951	14.7	25.0	26.6	21.4	29.7	19.3
1952	15.4	23.2	27.2	25.6	31.0	23.1
1950-52	**14.8**	**23.2**	**26.4**	**23.2**	**30.0**	**21.1**
1953	15.8	21.9	26.3	27.2	30.5	21.0

. Information either non-existent or not available * Provisional

TABLE I. DEATH-RATE FROM CANCER OF THE BREAST, PER 100 000 FEMALES, BY YEAR (concluded)

Year	Canada	Chile	USA	Japan	Australia	New Zealand
1920	.	1.0	15.3	.	11.7	11.0
1921	.	1.1	15.8	.	13.6	14.5
1922	.	0.9	15.6	.	15.0	12.2
1923	.	0.8	15.7	.	15.1	11.9
1924	.	1.4	16.5	.	14.4	19.6
1920-24		**1.0**	**15.8**		**14.0**	**13.8**
1925	.	1.5	16.4	.	15.2	17.7
1926	14.1	1.3	17.5	.	15.2	18.2
1927	15.3	2.3	17.6	.	16.5	18.3
1928	16.5	1.1	17.5	.	16.1	21.4
1929	16.7	2.2	17.5	.	16.9	22.4
1925-29	**15.6**	**1.7**	**17.3**		**16.0**	**19.6**
1930	17.7	3.5	18.5	.	16.3	22.5
1931	17.7	2.2	19.1	.	18.5	21.1
1932	18.8	2.5	19.7	.	18.4	20.8
1933	19.7	2.4	19.8	.	19.1	23.6
1934	19.0	3.4	20.8	.	20.1	26.3
1930-34	**18.6**	**2.8**	**19.6**		**18.5**	**22.9**
1935	18.7	4.2	20.7	.	20.8	24.3
1936	21.2	2.7	21.3	.	21.8	26.8
1937	20.5	3.0	21.5	.	20.6	25.7
1938	22.0	3.8	22.2	.	22.7	21.1
1939	21.6	3.4	22.6	.	21.3	23.7
1935-39	**20.8**	**3.4**	**21.7**		**21.4**	**24.3**
1940	22.5	3.5	23.3	.	22.3	27.2
1941	22.8	3.5	23.1	.	24.9	30.8
1942	22.5	4.3	23.4	.	23.9	26.9
1943	23.4	3.6	23.4	.	26.1	28.4
1944	22.0	4.2	23.4	.	24.0	29.1
1940-44	**22.6**	**3.8**	**23.3**		**24.2**	**28.5**
1945	22.5	4.6	24.1	.	24.2	28.5
1946	23.2	3.5	24.3	.	24.7	27.9
1947	22.6	4.2	24.7	3.0	25.3	26.8
1948	23.7	3.7	25.8	3.0	25.8	27.6
1949	23.4	4.6	24.5	3.3	24.5	29.1
1945-49	**23.1**	**4.1**	**24.7**	**3.1**	**24.9**	**28.0**
1950	22.6	4.7	24.7	3.4	23.5	27.8
1951	22.7	5.7	24.5	3.3	22.5	28.6
1952	23.1	.	24.9	3.3	24.5	29.4
1950-52	**22.8**	**5.8**	**24.7**	**3.3**	**23.5**	**28.6**
1953	23.9	5.2	25.3	3.3	27.8	25.9

. **Information either non-existent or not available** * **Provisional**

THE NON-GOVERNMENTAL ORGANIZATIONS AND THE WORLD HEALTH ORGANIZATION

Forty non-governmental organizations, with offices throughout the world, are at present in official relationship, and work in close collaboration, with WHO. These organizations, and many others, draw ideas and inspiration from WHO in its capacity as a specialized agency of the United Nations. Conversely, WHO has recourse to many NGO's in certain specialized fields. How did this closely linked system of co-operation between non-governmental and inter-governmental organizations arise? What obligations are incurred by participating in it?

When the League of Nations was created in 1919, the number of these NGO's was still relatively small. However, between the wars, their numbers grew very rapidly and by 1945, when representatives of many governments were in San Francisco to draft a charter for the United Nations, it was certain that they could not ignore the immense store of goodwill represented by some 1 000 NGO's with a membership of nearly 700 million people. Indeed, these organizations had become of such importance that it was essential to bring them into direct collaboration if the United Nations were to accomplish its tasks successfully. This participation was achieved by the specific references to collaboration contained in Article 71 of the United Nations Charter. Indeed, this Article constituted a juridical innovation as, for the first time, a constitutional link had been established between governmental and non-governmental organizations.

The framework of collaboration

When the constitutions of certain of the United Nations specialized agencies were drafted, due consideration was given to the terms of Article 71 of the United Nations Charter, and through the wording of certain Articles in these constitutions, the non-governmental organizations were assured of consultation and co-operation with the Agencies. For example, Article 71 of the WHO Constitution reads as follows:

> The Organization may, on matters within its competence, make suitable arrangements for consultation and co-operation with non-governmental international organizations and, with the consent of the Government concerned, with national organizations, governmental or non-governmental.

Once the principle had been established in its Constitution, the WHO Interim Commission, and later the First World Health Assembly, introduced certain provisions designed to regulate the admission of NGO's to a status which was called " official relations " with WHO. The Interim Commission stated that these provisions " would strengthen the WHO and prevent the spread of the idea in the medical profession that the WHO, as an inter-governmental body, necessarily tends to oppose the legitimate interests of the medical profession. Advice from these non-governmental professional bodies would be of great benefit to the studies that the WHO might undertake in the field of medical practice and medical education." [1]

With these precepts as a background, it was possible to develop many forms of collaboration between WHO and the non-governmental organizations. However, no attempt was made, either by the Assembly or the Executive Board, to codify or define the limits of any collaboration. In fact, this would have been impossible, as it was also

[1] *Off. Rec. Wld Hlth Org.*, 4, 97

NON-GOVERNMENTAL ORGANIZATIONS IN OFFICIAL RELATIONS WITH THE WORLD HEALTH ORGANIZATION

INTERNATIONAL ACADEMY OF LEGAL MEDICINE AND OF SOCIAL MEDICINE
INTERNATIONAL ASSOCIATION FOR THE PREVENTION OF BLINDNESS
THE BIOMETRIC SOCIETY
INTERNATIONAL COMMITTEE OF THE RED CROSS
INTERNATIONAL CONFERENCE OF SOCIAL WORK
COUNCIL FOR INTERNATIONAL ORGANIZATIONS OF MEDICAL SCIENCES
FEDERATION DENTAIRE INTERNATIONALE
INTERNATIONAL PHARMACEUTICAL FEDERATION
INTER-AMERICAN ASSOCIATION OF SANITARY ENGINEERING
INTERNATIONAL COUNCIL OF NURSES
INTERNATIONAL HOSPITAL FEDERATION
INTERNATIONAL FEDERATION FOR HOUSING AND TOWN PLANNING
INTERNATIONAL LEPROSY ASSOCIATION
LEAGUE OF RED CROSS SOCIETIES
INTERNATIONAL LEAGUE AGAINST RHEUMATISM
INTERNATIONAL UNION AGAINST CANCER
INTERNATIONAL UNION AGAINST TUBERCULOSIS
INTERNATIONAL UNION AGAINST VENEREAL DISEASES AND THE TREPONEMATOSES
INTERNATIONAL UNION FOR CHILD WELFARE
WORLD FEDERATION FOR MENTAL HEALTH
WORLD FEDERATION OF UNITED NATIONS ASSOCIATIONS
WORLD MEDICAL ASSOCIATION
INTERNATIONAL ASSOCIATION OF MICROBIOLOGICAL SOCIETIES
INTERNATIONAL SOCIETY FOR THE WELFARE OF CRIPPLES
INTERNATIONAL PAEDIATRIC ASSOCIATION
CENTRAL COUNCIL FOR HEALTH EDUCATION
INTERNATIONAL COMMITTEE OF CATHOLIC NURSES
MEDICAL WOMEN'S INTERNATIONAL ASSOCIATION
UNION OSE—(Child Relief and Health Protection of Jewish Populations)
INTERNATIONAL UNION FOR HEALTH EDUCATION OF THE PUBLIC
INTERNATIONAL HYDATIDOLOGICAL ASSOCIATION
INTERNATIONAL SOCIETY OF CRIMINOLOGY
INTERNATIONAL SOCIETY FOR BLOOD TRANSFUSION
INTERNATIONAL ORGANIZATION AGAINST TRACHOMA
INTERNATIONAL COMMISSION ON RADIOLOGICAL PROTECTION
INTERNATIONAL COMMISSION ON RADIOLOGICAL UNITS AND MEASUREMENTS
PERMANENT COMMITTEE FOR THE INTERNATIONAL VETERINARY CONGRESSES
WORLD VETERANS FEDERATION
INTERNATIONAL FEDERATION OF GYNECOLOGY AND OBSTETRICS
WORLD CONFEDERATION FOR PHYSICAL THERAPY

impossible to establish any logical classification to cover the innumerable examples of working relationship and the results which these later achieved. The only limits which were imposed were those laid upon the work and resources of WHO on the one hand, and the qualifications and activities of the NGO's on the other.

There is little doubt that the Organization's development during its first eight years, and some of its achievements during that period, were due in part to the close collaboration of WHO and the non-governmental organizations. This fact was indeed underlined on several occasions by the Assembly and by the Executive Board. It was, of course, certain that collaboration of this character did not come about by chance. The new ideas of the inter-war years and, perhaps more important, the widespread international collaboration in the field of medicine during the war itself, brought about a change of climate in international thinking. Thus it was that in 1946 some 60 governments were able to agree on the creation of a world health organization. Another sign of this change was the growth of many non-governmental organizations concerned with practically every aspect of medical science. However, although the governments had set up WHO, it was for the Organization itself to make its mission understood; and, in this task, the help of many powerful NGO's did ensure that WHO's aims and objects were brought home to the people of many different countries and faiths.

Working procedures

The number of NGO's which have so far requested to be admitted to official relationship with WHO is now 68, and this is indeed a good proof of the interest these organizations show in WHO's work. However, in order to stress the significance of these relationships, the Executive Board each year

subjects the applications made to the most careful scrutiny, and this has meant that up to the present, only 40 non-governmental organizations have been admitted to official relations with WHO.

Those organizations which are in official relations with the Organization receive extensive documentation on its work, send representatives to its meetings, and maintain contact with members of its staff. In addition, there is the important question of concrete collaboration in certain WHO projects. All these activities are reflected in publications issued by NGO's, in reports made by their officers, and in debates at their conferences, in which WHO representatives often participate. Thus WHO is often the subject of comment, appraisal and even criticism by the non-governmental organizations. There can be no doubt that this helps the Organization to keep in close touch with outside medical and expert opinions.

If WHO profits from these relationships, the reverse process is also true. If, for example, the Secretary General of an NGO visits a federated national association, he may well make use of the services available at a WHO regional office; WHO may be asked for advice by an organization with regard to the functioning of a hospital; WHO experts may be invited to participate in study courses organized by NGO's, or WHO and a group of NGO's may unite their efforts to analyse various aspects of a particular problem. In fact, all these instances show that there is no one single beneficiary in this process of collaboration. Both WHO and the non-governmental organizations benefit, and both make their contribution to the common good.

The non-governmental organizations in official relationship with WHO cover a wide variety of medical subjects; for example, biometry, pharmacy, sanitary engineering, leprosy, rheumatism, cancer, tuberculosis, microbiology, health education, blood transfusion, trachoma, gynaecology, physiotherapy, paediatrics, mental health, nursing, hospitals, etc. Nevertheless, within these clearly defined fields co-operation may take a great many forms.

It occasionally happens that WHO has to rely almost exclusively on the technical assistance given by a non-governmental organization in a specific field. A case in point was that of two very closely linked organizations, the International Commission for Protection against Radiations and the International Commission on Radiological Units. Without the assistance of these two bodies which between them concentrate practically the whole of world expert knowledge of the subject in question, WHO would not have been able to contemplate an adequate approach to the immensely important question of the utilization of atomic energy for peaceful purposes.

Another instance of a different form of co-operation is the practice, which has now become customary, of requesting the advice of NGO's in regard to the constitution of WHO "Expert Advisory Panels", and in the recruitment of consultants. These consultants may be required to carry out certain specific duties within the WHO Secretariat, either at Headquarters or in a regional office, and to fulfil certain special missions in connexion with assistance programmes to Member States, or individual teaching missions.

Non-governmental organizations are not invited to participate as such in meetings of WHO Expert Committees. However, it is not uncommon that a member of an Expert Committee belongs to an NGO which is active in the particular subject under discussion, and thus the member can, without representing his organization or speaking on its behalf, bring his experience to bear for the benefit of other participants in the Committee.

There can be no better example of the value of collaboration than the active partici-

pation of a non-governmental organization in a WHO project. Once a precise agreement has been reached on the scope of the work to be done the particular NGO will then undertake a clearly defined task on behalf of WHO. There are numerous examples of such agreements, and it would seem to be of general interest to cite some of the work projects undertaken:

(*a*) the World Federation for Mental Health undertook to collect details on psychiatric treatment in penitentiaries and on the rehabilitation of patients suffering from mental disease;

(*b*) the International Council of Nurses agreed to publish a booklet on advanced training programmes for nurse-tutors, giving the continuation training programmes in 127 establishments;

(*c*) the International Federation of Hospitals was concerned with the preparation of plans for hospitals in tropical regions;

(*d*) the International Paediatric Association made a study of the teaching of paediatrics in Europe;

(*e*) the International Dental Federation prepared a world directory of dental schools and a study of the various types of dental services; and, finally,

(*f*) the International Association for the Prevention of Blindness undertook a search for an internationally acceptable definition of blindness.

Quite apart from the various forms of collaboration already mentioned, there are others which in their own way are equally valuable. Examples might be given of a non-governmental organization helping WHO to prepare a technical conference, or collecting documentation for a WHO Expert Committee, or supplying information on regional conditions. On the occasion of World Health Day each year one or more of the NGO's, according to the chosen theme, collaborate in the celebration of the event and thus help WHO obtain wider publicity. A final example might be taken from the proceedings at the Ninth World Health Assembly which had, for the theme of its technical discussions, " Nurses, their Education and their Role in Health Programmes ". At WHO's request, the two principally interested organizations, namely the International Council of Nurses and the International Committee of Catholic Nurses, as well as the League of Red Cross Societies, asked their national associations to arrange meetings and discussions, to obtain the collaboration of the public authorities, and to report on the results. More than 40 reports were sent in, and these provided extremely valuable basic material in the preparation of the Assembly Technical Discussions.

Special forms of collaboration

Examples which have already been given refer usually to the great majority of NGO's whose activities are limited to a special sphere of operations. There are, however, certain other organizations in official relationship which cannot be placed in a definite category by reason of the wide scope of their activities. In particular, mention should be made of the International Committee of the Red Cross, the League of Red Cross Societies, and the World Medical Association.

It is obvious that the support given to WHO by the two great international Red Cross institutions cannot be limited to a formula. Similarly, the relations between WHO and the World Medical Association embrace a number of different subjects and the First World Conference on Medical Education—soon to be followed by the second—provides perhaps a fitting example of the scope of this collaboration.

Two other non-governmental organizations occupy specific places in relationship to WHO. They are: the World Federation of United Nations Associations and the Council for International Organizations of

Medical Sciences. The former gives its support to WHO in the latter's capacity as a specialized agency of the United Nations. In addition to the study courses on WHO which the Federation organizes during each World Health Assembly, it also undertakes a considerable amount of educational work on behalf of the Organization.

The Council for International Organizations of Medical Sciences was set up a few years ago under the joint auspices of UNESCO and WHO. The aims of the Council are to co-ordinate the various international medical science associations with regard to their conferences, the dissemination of their work, and exchanges of information. The Council receives an annual subsidy from UNESCO and WHO, and these organizations may avail themselves of its services. When they do not actually take a direct part in the Council's activities, they follow the work being done very closely.

It is perhaps almost unnecessary to add that, through the support, understanding, and encouragement of enlightened opinion, the NGO's greatly assist WHO and the other international agencies in the accomplishment of their mission.

Epidemiological and Statistical Information

MORTALITY FROM PNEUMONIA

A recent number of the WHO *Epidemiological and Vital Statistics Report* [1] gives some statistical tables containing the latest available information on mortality from pneumonia for the years 1951, 1952 and 1953 (and in some cases 1954), with respect to 14 European and 6 non-European countries, and side by side with the corresponding figures for the period 1936-38.

It might be useful to give here, in the first instance, some details concerning the rubric relating to pneumonia in the *International Statistical Classification of Diseases, Injuries and Causes of Death.* According to the abridged List at present in force (Sixth Revision, 1948), " Pneumonia " includes the following forms of the disease:

Lobar pneumonia;
Bronchopneumonia;
Primary atypical pneumonia;
Other and unspecified pneumonia.

Although the content of the rubric in question appears to tally with that of the corresponding rubric in the previous classification (Fifth Revision of 1938), there is, nevertheless, one difference, i.e. deaths from pneumonia among infants under four weeks old, which were previously included under " pneumonia ", are now classified under a separate heading in the detailed List (" Pneumonia of newborn ") in the chapter dealing with early infancy. In order, therefore, to make comparison possible between figures based on two successive revisions of the List, the post-1949 figures have been adjusted, wherever possible, by the addition of the deaths due to " Pneumonia of newborn ". It has, however, only been possible to effect this adjustment with respect to those countries which use the detailed List for the classification of causes of death.

The importance of pneumonia of the newborn in relation to infant mortality (under one year) and to general mortality (all ages) from pneumonia can be assessed on the basis of the following examples:

[1] *Epidem. vital Statist. Rep.*, 1956, 9, 510-532 (No. 9). This number also contains data relating to mortality from cholelithiasis in 11 countries, during the past few years.

MORTALITY FROM PNEUMONIA

			Infant mortality (Rate per 1000 live births)			*General mortality* (Rate per 1000 inhabitants)		
			A	B	Difference %	A	B	Difference %
Japan	1951-52	M	7.8	10.5	+35	0.52	0.59	+13
		F	7.0	9.4	+34	0.45	0.51	+12
Ireland	1951-52	M	5.6	7.1	+28	0.42	0.46	+8
		F	4.7	5.8	+24	0.39	0.41	+6
Norway	1951-52	M	3.6	4.0	+11	0.38	0.38	+1.3
		F	2.8	3.2	+15	0.46	0.47	+1.5

A: *not including pneumonia of newborn*
B: *including pneumonia of newborn*

It is, however, unlikely that the differences in the rates as between countries are to be entirely explained by the inclusion or non-inclusion of deaths due to pneumonia of the newborn, nor even—in cases where it has been possible to adjust the figures—by the real differences in mortality from pneumonia. It must be remembered that the figures are affected by the degree of accuracy in diagnosis of causes of death, particularly with respect to aged persons, in whom pneumonia is quite frequent. Finally, in regard to pneumonia of the newborn—concerning which there are considerable variations from country to country—the efficacy or inefficacy of systems of registration of live births must be taken into account.

Evolution of mortality from pneumonia

It is a well known fact that many and various factors intervene in morbidity and mortality. In a given community, the effect of social and economic factors on infant morbidity and mortality will vary. The size and composition of families, housing conditions, diet, family incomes, existence or non-existence of appropriate medical services and the extent to which they are used—these are only a few of the contributory elements.

A number of points worthy of some attention emerge from brief analysis of the details published in the *Report*:

(1) During the period between 1936-1938 and 1951-1953, the drop in mortality from pneumonia continued and became more marked for all age-groups except that of 80 years and over (see Table II), and this drop was due in particular to the administration of antibiotics.

(2) This decrease contributed very largely to the lowering of mortality among infants and young children. It should be noted that in most countries pneumonia is one of the principal causes of infant mortality—as important as the communicable diseases of early infancy and gastro-enteritis.

(3) The absence of any simultaneous increase in mortality from bronchitis proves that the drop in deaths registered as being due to pneumonia was not the result of pneumonia deaths being attributed instead, on death certificates, to some related cause such as bronchitis.[2]

Comparisons with general mortality

Mortality from pneumonia is an important item in general mortality. Although in most countries pneumonia causes less deaths than heart diseases, vascular lesions, cancer, genital malformations, diseases peculiar to early infancy, accidents, etc., it is nevertheless one of the principal causes.

Table I shows the proportion of deaths from pneumonia as compared with total deaths, in selected countries, in 1938 and in the period 1951-53. These proportions range from 4.4% (France) to 15.5% (Italy) in 1938; from 2.5% (New Zealand) to 6.7% (Portugal) in 1951; from 2.5% (New Zealand)

[2] One of the Tables in the *Report* gives the figures for deaths from bronchitis from 1951 to 1956, in some countries (*Epidem. vital Statist. Rep.* 1956 ,9, 533)

TABLE I. PERCENTAGES OF MORTALITY DUE TO PNEUMONIA (ALL FORMS) IN RELATION TO GENERAL MORTALITY, IN SELECTED COUNTRIES 1938 AND 1951-53

Country	1938	1951	1952	1953
Australia (excluding pure-blooded aboriginals)	6.6	4.0	3.6	3.5
Canada [a]	7.0	4.1	3.9	4.0
Denmark	7.8	4.4	2.9	2.5
Finland	7.1	4.3 *	4.7 *	4.9 *
France	4.4 [b]	6.1	4.4	5.4
Germany (Fed. Rep.)	7.2 [c]	4.6	4.0	4.5
Ireland	5.7	3.5	3.1	2.9 *
Italy	15.5	6.6	6.2	6.4
Japan	8.9 [b]	6.0	5.6	6.0
Netherlands	6.8	3.1	3.0	3.2
New Zealand (excluding Maoris)	6.6	2.5	2.5	2.3
Northern Ireland	5.8	4.4 *	3.7 *	3.9 *
Norway	9.5	5.1	4.9	5.2 *
Portugal	7.8 [d]	6.7	6.5 *	6.5 *
Scotland	6.1	3.7	3.2	3.0
Sweden	8.1	3.9 *	4.0 *	4.1 *
Switzerland	6.6	2.7 *	2.1 *	2.5 *
Union of South Africa (European populat.)	8.4	6.2 *	5.8 *	5.6 *
United Kingdom (England and Wales)	5.4	4.3	3.9	4.3
United States of America	6.4	3.0	2.9	3.0

* Not including pneumonia of newborn.

[a] Excluding Yukon and North West Territories; in 1938 excluding Newfoundland.

[b] 1936

[c] Former Reich territory.

[d] 1937

to 3.6% (Portugal) in 1952, and from 2.3% (New Zealand) to 6.3% (Portugal) in 1953. It will be noted that from 1951 the rates for Italy correspond to those for other countries. An interesting feature is the percentage drop (in relation to general mortality) in deaths due to pneumonia in the period from 1938 to 1951 in a number of countries.

The sharpest declines were in New Zealand, Switzerland, Italy, the Netherlands, the United States and Sweden, where decreases ranged from 62.1% to 51.9%. In Norway, Denmark, Canada, Finland, Australia, Scotland, Ireland, Germany and Japan there were diminutions ranging from 46.3% to 32.6%. In the Union of South Africa, Northern Ireland, England and Wales, and Portugal the figures dropped by from 26.2% to 14.1%. In fact, there was a fairly marked decrease for all the countries studied with the exception of France, where an increase was registered during the period in question.

Mortality by sex and by age

The differences in male and female mortality rates in the various countries are quite considerable, but in general the rate is higher for males.

Table II shows the variations in mortality rates, by sex and by age, as between the period 1936-38 and the three last years for which figures are available (1951-53 or 1952-54). It will be seen that the rates fell for all age-groups except the over-80 group (and in two cases the 70-79 years group); in general, the decline was most marked in the 20 to 40 years age-groups.

Distribution of the various forms of pneumonia

Analysis of the figures for the latest year for which information is available in each country shows that, among the various forms of pneumonia (see page 414), bronchopneumonia is responsible for most deaths in nearly all countries, and in general by a wide margin. In Japan, however, lobar pneumonia takes first place: it is responsible for about half the deaths from pneumonia. In Germany and France, " Primary atypical pneumonia " and " Other and unspecified pneumonia " account for most deaths.

The above-mentioned distribution is the same for both sexes. Since 1951 there have been no very marked annual variations and there seems justification for expecting some stabilization of mortality in this field in the coming years.

TABLE II. COMPARISON (%) OF RATES OF MORTALITY FROM PNEUMONIA (ALL FORMS) FOR SELECTED COUNTRIES, BY SEX AND AGE

Country	Periods compared *	Variations (%) in mortality rates for each age-group										
		All ages	-1†	1-4†	5-19	20-29	30-39	40-49	50-59	60-69	70-79	80 &+
		Males										
Australia (excluding pure-blooded aboriginals)	1951-53 / 1936-38	—48	—41	—78	—80	—87	—80	—76	—64	—55	—41	—15
Canada [a]	1952-54 / 1936-38	—49	—42	—75	—79	—85	—84	—81	—73	—69	—58	—38
Denmark	1952-54 / 1936-38	—76	—82	—89	—90	—92 [c]	—91 [d]	—92 [e]	—85 [f]	—79 [g]	—77 [h]	—63 [i]
Finland	1951-53 / 1936-38	(—58)	(—60)	—80	—84	—94	—91	—83	—74	—55	—20	+108
France	1952-54 / 1936	—24	—57	—80	—84	—88	—88	—79	—57	—33	+26	+101
Germany [b]	1952-54 / 1938	(—52)	(—39)	(—80)	(—84)	(—91)	(—90)	(—84)	(—74)	(—63)	(—45)	(—25)
Ireland	1951-53 / 1936-38	—56	—46	—77	—75	—78	—88	—86	—69	—61	—34	
Italy	1951-53 / 1936-38	—69	—50	—84	—84	—91	—92	—88	—81	—75	—59	—32
Japan	1951-53 / 1936	(—69)	(—64)	—76	—76	—85	—84	—82	—77	—62	—34	
Netherlands	1952-54 / 1936-38	—64	—71	—84	—77	—89	—93	—85	—77	—67		—46
New Zealand (excluding Maoris)	1951-53 / 1936-38	—63	—37	—83	—95	—96	—89	—94	—88	—73	—59	+10
Northern Ireland	1952-54 / 1936-38	(—53)	(—53)	—91	—76	—91	—87	—89	—69	—49	—3	+50
Norway	1951-53 / 1936-38	(—62)	(—55)	—85	—88	—93	—93	—90	—83	—80	—66	—33
Portugal	1952-54 / 1937	(—39)	(—37)	—37	—44	—75	—68	—64	—52	—38	—16	+32
Scotland	1952-54 / 1936-38	—63	—66	—91	—88	—94	—91	—90	—77	—55	—28	+2
Sweden	1951-53 / 1936-38	(—64)	(—79)	—86	—87	—95	—94	—90	—85	—71	—39	
Switzerland	1951-53 / 1936-38	(—67)	(—72)	—87	—89	—89	—89	—88	—85	—73	—57	
Union of South Africa (European population)	1951-53 / 1936-38	(—45)	(—52)	—69	—68	—83 [c]	—73 [d]	—74 [e]	—70 [f]	—54 [g]	—3 [i]	
United Kingdom (England and Wales)	1952-54 / 1936-38	—41	—53	—88	—81	—88	—87	—82	—70	—36	+11	+56
United States of America	1951-53 / 1936-38	—65	—63	—80	—84	—89	—87	—82	—75	—69	—62	—54
		Females										
Australia (excluding pure-blooded aboriginals)	1951-53 / 1936-38	—41	—43	—72	—72	—73	—80	—74	—68	—65	—51	—9
Canada	1952-54 / 1936-38	—53	—37	—75	—75	—83	—87	—82	—79	—80	—71	—48

TABLE II. COMPARISON (%) OF RATES OF MORTALITY FROM PNEUMONIA (ALL FORMS) FOR SELECTED COUNTRIES, BY SEX AND AGE (continued)

Country	Periods compared *	Variations (%) in mortality rates for each age-group										
		All ages	–1†	1–4†	5–19	20–29	30–39	40–49	50–59	60–69	70–79	80&+
		Females										
Denmark	1952–54 / 1936–38	+72	—78	—86	—88	—91 [c]	—85 [d]	—87 [e]	—88 [f]	—80 [g]	—78 [h]	—63 [i]
Finland	1951–53 / 1936–38	(—43)	(—61)	—82	—86	—87	—88	—79	—75	—58	+2	+98
France	1952–54 / 1936	—5	—55	—79	—84	—81	—83	—79	—66	—44	—	+82
Germany	1952–54 / 1938	(—46)	(—32)	(—80)	(—79)	(—81)	(—82)	(—79)	(—75)	(—65)	(—45)	(—22)
Ireland	1951–53 / 1936–38	—51	—40	—73	—67	—84	—80	—83	—75	—65	—26	
Italy	1951–53 / 1936–38	—67	—46	—83	—84	—89	—90	—87	—84	—77	—62	—34
Japan	1951–53 / 1936	(—69)	(—62)	—74	—79	—85	—83	—80	—71	—58	—30	
Netherlands	1952–54 / 1936–38	—60	—69	—78	—73	—88	—88	—78	—79	—65		—48
New Zealand (excluding Maoris)	1951–53 / 1936–38	—45	—22	—79	—91	—94	—93	—92	—86	—69	—40	+7
Northern Ireland	1952–54 / 1936–38	(—48)	(—56)	—90	—80	—76	—94	—81	—65	—57	—23	+73
Norway	1951–53 / 1936–38	(—54)	(—53)	—81	—84	—87	—91	—89	—87	—81	—64	—27
Portugal	1952–54 / 1937	(—39)	(—38)	—38	—37	—75	—71	—67	—60	—46	—34	+29
Scotland	1952–54 / 1936–38	—54	—68	—92	—75	—83	—75	—72	—67	—52	—40	+22
Sweden	1951–53 / 1936–38	(—59)	(—80)	—81	—83	—83	—91	—87	—81	—74	—42	
Switzerland	1951–53 / 1936–38	(—61)	(—71)	—83	—75	—79	—82	—85	—85	—80	—59	
Union of South Africa (European population)	1951–53 / 1936–38	(—38)	(—46)	—72	—69	—61 [c]	—66 [d]	—75 [e]	—61 [f]	—62 [g]	—7 [i]	
United Kingdom: (England and Wales)	1952–54 / 1936–38	—23	—51	—88	—76	—79	—78	—71	—60	—40	— 8	+48
United States	1951–53 / 1936–38	—66	—62	—79	—81	—88	—87	—84	—81	—79	—71	—59

* The periods compared are indicated in the first column as they are not the same for all the countries mentioned.

† Figures in brackets in these two columns exaggerate the drop in mortality from one period to the other; in fact, the data on which the calculations were based included pneumonia of the newborn in the period 1936-38 but not in the periods 1951-53 or 1952-54. Mortality rates for all age-groups and for the under-one-year group are therefore, for the later period, lower than the real rates. (See page 414.)

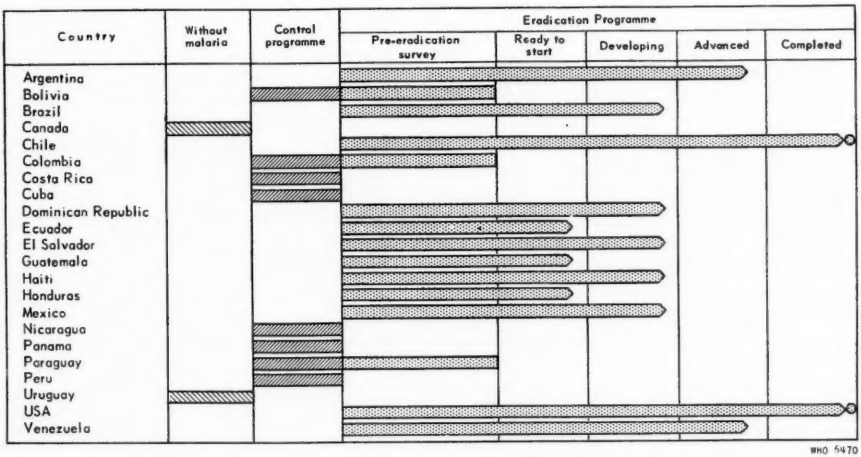
[a] Excluding the Yukon and North West Territories; in 1936-38, excluding Newfoundland.

[b] In 1938, territory of former German Reich; in 1952-54, Federal Republic.

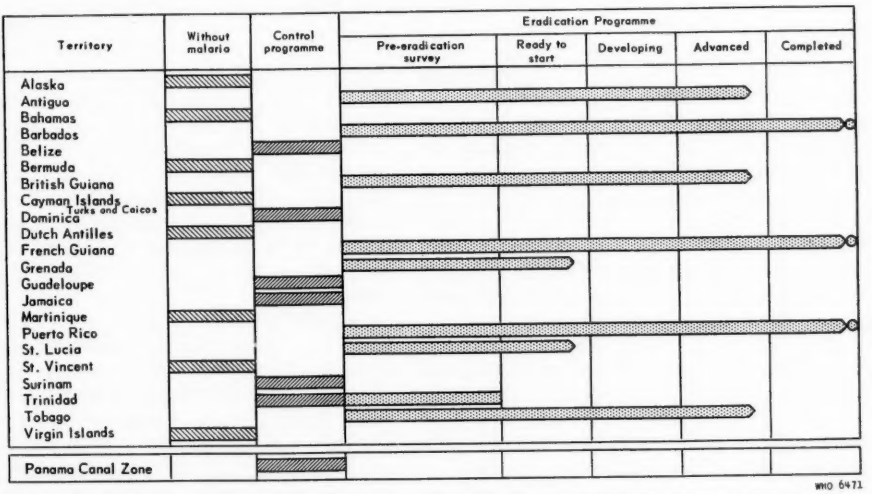
[c] 20-24 years
[d] 25-34 years
[e] 35-44 years
[f] 45-54 years
[g] 55-64 years
[h] 65-74 years
[i] 75 years and over
65 years and over

STATUS OF MALARIA CAMPAIGNS IN THE AMERICAS

(April 1956)



The charts show in schematic form the progress which is being made throughout the Americas in malaria eradication programmes, many of which receive direct assistance from WHO.



Health Legislation

MALARIA : EXISTING LEGISLATION SURVEYED

Although it is impossible to draft a uniform malaria control law, by reason of differing regional conditions, nevertheless certain steps towards unity have been suggested. At the Fourteenth Pan American Sanitary Conference (1954), for example, criticisms were made of the malaria control legislation then in force, inasmuch as it had not been adjusted to the new concepts of malaria eradication. The Inter-regional Conference on Malaria for the Eastern Mediterranean and European Regions, which was held in Athens in June 1956, came to the same conclusion, and also formulated certain basic principles which might be followed in drafting malaria control legislation. These could serve as a guide to a country which might wish to amend its malaria control legislation or to enact a new malaria control law.

The differences existing in malaria control laws at present in force in 25 countries and territories are revealed in an analytical survey just published in the *International Digest of Health Legislation*.[1] Generally speaking, the various laws which have been examined may be classified as follows:

1. Those laws, few in number, whose provisions cover all aspects of malaria control (notification, organization of malaria control services, compulsory examination and treatment, larval control measures, etc.)

2. Those laws which make provision primarily for larval control measures. Some of these have recently been amended to include imagocidal measures. Very often they have been enacted some years ago and are of a uniform type.

3. Communicable disease laws whose provisions generally apply to malaria as well. Countries in which this form of legislation exists do not normally possess a malaria control law.

4. Laws of a purely provisional character, dealing mainly with the financing of malaria control campaigns.

Because of the varied nature of this legislation it is not easy to detect any general trends. It is, however, noticeable that the concept of endemic zones is developed in a number of laws. While the definitions of these zones vary from country to country, they are nevertheless of importance because malaria control work is primarily carried on in such areas.

Most laws make malaria a compulsorily notifiable disease. However, in several countries where malaria is endemic this is not so, although it is in others which are free from the disease. It is sometimes specified that notification of a case of malaria must be supported by a statement of the type of parasite involved, as revealed by blood examination. In Argentina, physicians are forbidden to initiate anti-malarial treatment until a blood examination has been made. In several Latin American countries the population, and particularly those resident in endemic zones, may be required to submit to a clinical or blood examination.

In most of the 25 countries covered by this survey, the authorities responsible for malaria control measures have very extensive powers; of these the most important is the power to enter upon private property in order to ascertain whether malaria control regulations are being applied or, where necessary, to execute in summary fashion the measures prescribed. Likewise in most countries various commercial and industrial concerns are required to provide their employees with anti-

[1] See *Int. Dig. Hlth Leg.*, 1956, 7, 537. This survey will be published later as a pamphlet (price: 1/9, $0.30, Sw. Fr. 1.—.

malarial drugs and to organize health services and give facilities for examination and treatment. In two of the countries surveyed malaria is designated as an occupational disease. Commercial and industrial undertakings are also subject to strict regulations designed to prevent the formation of breeding grounds by interference with hydrological conditions or through land excavation, and there are also very often special provisions relating to ricefields.

Only the more recent malaria legislation provides for the use of residual insecticides. The majority of legal provisions relating to the use of insecticides are general in character, and precise methods are left to the discretion of the health authorities. In a few countries insecticides and antimalarials are exempt from excise and customs duties.

This analytical survey published in the *Digest* includes the following chapter headings: Introduction. Endemic zones. Measures in respect of persons (compulsory notification; compulsory examination; compulsory treatment; immigration; malaria as an occupational disease; health education). Malaria control services (organization; powers of the authorities; medical services; distribution of drugs). Imagocidal measures. Larval control measures. Man-made malaria (undertakings; ricefields and similar crops). Antimalarials. Miscellaneous. Appendix: Malaria control legislation of Argentina. References.

Notes and News

Sanitary Regulations Seminar

An important seminar on the application of the International Sanitary Regulations is due to be held in Venezuela between 21 and 26 January 1957 under the auspices of the Pan American Sanitary Bureau (Regional Office of WHO for the Americas). This seminar will draw together Directors of Health and officials responsible for the application of the International Sanitary Regulations in the ten republics of South America. The programme will comprise two main topics: application of the Regulations and case reporting. Under the first heading, discussions will be held on the general provisions of the Regulations and of those dealing with yellow fever, plague, typhus and smallpox. Under the second there will be an analysis of the progress made in the field of case reporting in South America since 1953. Plans will be discussed for weekly and annual reporting.

In addition the seminar will include general discussions on the new provisions of the Regulations with special reference to yellow fever, and on reports for malaria and the malaria eradication programme.

Pilot project on trachoma

In the course of a recent epidemiological survey on trachoma carried out by a WHO consultant, Dr M. Radovanovic, in certain districts of the United Provinces and the Punjab in India, some startling facts were brought to light. A door-to-door check in ten villages selected at random showed that the percentage of infected cases of trachoma among children of school age (7-15 years) might run as high as 65 per cent. in the Punjab, and 78 per cent. in the United Provinces. In some parts of the villages surveyed adult percentages ran at 90 for the Punjab and 86 for the United Provinces.

Under an agreement signed between the Government of India and WHO a pilot project for trachoma control has been inaugurated at Tappal, 32 miles from Aligarh. The project will be devoted to

developing techniques and procedures for a mass control programme on the basis of an intensive study of the incidence and pattern of trachoma in the country, the factors favouring transmission, the minimum effective course of antibiotic treatment under prevailing conditions and the rates of relapse and re-infection during the follow-up period.

This project is based on the Gandhi Eye Hospital and the Muslim University Institute of Ophthalmology at Aligarh. It will be carried out under the guidance of the Indian Council of Medical Research and under the joint auspices of the Indian Government and WHO.

Mecca pilgrimage

Seven hundred thousand pilgrims participated in the pilgrimage to Mecca in the Year of the Hegira 1374 (1955 A.D.). Many of these pilgrims made long voyages from their homes to the Hedjaz, and some came from far-distant countries such as Thailand and Indonesia. Despite the very large numbers involved, the Saudi Arabian health administration was able to report on 4 August to WHO that the entire pilgrimage was free of infection.

These facts, together with other details of the Mecca pilgrimage, are included in the supplement to WHO's *Weekly Epidemiological Record* (1956, No. 43, Supp. 4). Thirty-three states and territories complied with the International Sanitary Regulations and submitted to WHO details of the health and welfare of the pilgrims on their journeys to and from the Hedjaz.

Some of these mass movements of pilgrims were on a very large scale. Egypt, for example, reported that 12 ships, sailing between Suez and Jeddah, had made 47 voyages between 15 June and 24 July. They carried 43 118 pilgrims, of whom 33 357 were Egyptians. The Egyptian El Tor quarantine station dealt with 43 932 pilgrims when on their return journeys, nearly 17 000 more than in the year previous.

The close attention which is now being paid to the health of pilgrims was well illustrated in the reports sent in to the World Health Organization under the relevant Articles of the International Sanitary Regulations. These were in some cases most detailed and included particulars of the number of cases treated, and the number and causes of death, in addition to the information required under the Regulations.

The Mecca pilgrimage of 1955 might be considered as an indication of the positive results which can be achieved by international co-operation in the field of epidemic control measures.

Regional Nursing Congress in Mexico City

The fourth Regional Nursing Congress to be held under PASB/WHO auspices since 1949 met in Mexico City from 9 to 15 September 1956. It was organized with the help of the Mexican *Secretaría de Salubridad y Asistencia* and the Mexican Nurses' Association. The large attendance—some 600 persons in all—was made up of nurses representing the following countries and territories: Argentina, Brazil, Costa Rica, Colombia, Cuba, Chile, El Salvador, French Guiana, Guadalupe, Guatemala, Haiti, Honduras, Jamaica, Martinique, Mexico, Nicaragua, Panama, Paraguay, Peru, United States of America, Uruguay, and Venezuela; representatives of international, governmental and non-governmental bodies; members of allied professions and nursing students, the two last-named participating as observers. Miss Alicia Roca Belmont (Mexico) was elected Chairman, and Miss Rebecca Flaquer (Chile), Vice-Chairman.

The object of these congresses is to give members of the nursing profession in the various countries an opportunity to exchange ideas on a chosen nursing subject, directly related to health services in general. The topic this year was "Nursing Administration" and, in accordance with previous practice, discussions were based largely on comprehensive documentation[1] that was

[1] Published in the September 1956 and later issues of the *Boletín de la Oficina Sanitaria Panamericana*

prepared and distributed in advance of the meeting.

The Congress drew up recommendations, some of which are of particular interest. These include, *inter alia*, suggested measures for improving national nursing services by: (1) creation of special nursing sections within national health administrations, under the direction of suitably qualified nurses, to co-operate in matters of nursing administration and training; (2) use of authentic data on national resources and needs as a basis for planning nursing services; (3) introduction of legislation on the nursing profession in countries where none as yet exists; and (4) introduction of salary scales for professional and auxiliary nurses, commensurate with level of post and training.

Measures designed to make available better training facilities in nursing administration were also advocated: (1) allocation of funds in national schools and associations for training programmes; (2) inclusion of nursing administration in the basic training curriculum, and provision of advanced courses in the subject; (3) introduction of in-service training; and (4) interchange of professional nurses among countries having advanced training courses.

The Congress suggested that three levels of nursing training should be instituted, namely: practical training for staff to be working under the supervision of a graduate nurse; basic professional training (prerequisite: not less than 9 years' general schooling); and advanced professional training for prospective administrative staff.

Ecological study of snail vectors

One of the biggest obstacles to effective bilharziasis control work in the past has been the lack of adequate knowledge of the natural history of snails—the intermediate hosts of the disease. This led the WHO Expert Committee on Bilharziasis [1] and the Study Group on Bilharzia Snail Vector Identification and Classification [2] to draw special attention to the need for ecological study of snail vectors. Without accurate data on such matters as growth rate, annual reproduction rate, life span, and aestivation, molluscicides cannot be effectively used and so control projects are jeopardized or made so expensive as to be beyond the resources of most countries where bilharziasis is prevalent. Experimental work done in Brazil and Egypt confirmed these findings. Hence the need for first priority to be given to basic research on these matters if future control work is to be fully effective.

Accordingly, one of the primary objectives set for the WHO-aided pilot bilharziasis control project started in 1953 in the Island of Leyte in the Philippines was study of the ecology of snails. The project is expected to go on for six years in all. The work done thus far has already produced very useful results and has led to a new concept of the whole problem, namely, that the disease can be controlled by putting the land to better use and changing agricultural practices.

The Organization recently carried this work a step further by arranging a meeting —held in Paris from 3 to 9 October 1956— of seven experts who have all done important malacological research work in the field. The pool of knowledge and experience thus gained is expected to have important repercussions on future work for bilharziasis control.

Their specific task was: (1) to define existing knowledge; (2) to examine the distribution of snail vectors as related to hydrogeology; (3) to discuss important ecological aspects of the vectors directly related to the use of molluscicides; (4) to discuss the relationship between the habitat of intermediate snail hosts and the habits of man, and agricultural, fish-farming and irrigation methods; and (5) to suggest suitable subjects for further field and laboratory research.

Survey of dental problems in the Americas

Following requests from a number of governments, Dr Mario Chaves, Consultant in

[1] *Wld Hlth Org. techn. Rep. Ser.*, 1953, 65
[2] *Ibid.*, 1954, 90

Public Health Dentistry on the staff of the Pan American Sanitary Bureau (WHO Regional Office for the Americas), has been organizing on-the-spot surveys of dental services throughout the Region. Up till July 1956, he had visited Mexico, Cuba, the Dominican Republic, Brazil, El Salvador, Guatemala, Honduras, Nicaragua, Uruguay, Paraguay, Chile, and Argentina, and was expected to complete the survey for the entire Region through visits to Peru, Bolivia, Ecuador, Colombia, Panama, Costa Rica, Venezuela, Trinidad, Haiti, and Jamaica. His report should be ready by the end of the year.

WHO's present policy—preliminary to a world programme for the improvement of dental health—is to collaborate with governments in drawing up realistic programmes in the five basic areas of periodontal diseases, malocclusion, oral cancer, oral clefts, and dental caries, its help being directed chiefly to questions of research, prevention, treatment, and education.

The PASB is planning to give attention to prevention of caries by fluoridation of water and to the problem of the availability of professional and sanitary workers. Dr Chaves' survey will give data on such matters as: the range of dental education; length of courses; number of yearly graduates; number of qualified dentists in each country, with indication of how they are located; availability of dental services for schoolchildren and for workers and their families; and dental associations—information which up to now has been generally lacking. These valuable data will serve as a basis for future long-term planning. It is already clear that in many areas—and especially the rural areas—the number of dentists is quite inadequate to cope with the most essential demands and that, taking account of retirements from the profession and increases in population, the yearly output of graduates is sometimes too low to maintain even the current ratio of dentists to population. It would seem that closer co-ordination of the efforts of dental schools, dentists working in public health, and dental associations will be necessary for any long-range improvement.

Earlier this year, Mr. Franz J. Maier, a sanitary engineer on loan to PASB/WHO from the United States Public Health Service as a consultant on water fluoridation, made an exploratory trip to a number of countries in the Region where water fluoridation has already begun or is under contemplation, including Peru, Chile, Argentina, Brazil, Trinidad, Guatemala, and Mexico. In conjunction with the national health authorities, he surveyed the possibilities of establishing pilot plants for demonstration purposes in Brazil, Mexico, and Chile. Projects of this kind would serve to guide the national public health schools in drawing up their curricula and would provide a training ground for waterworks operators, hydraulic and sanitary engineers, dentists, epidemiologists, sanitarians, and other interested public health personnel.

Notable among the recommendations made by the consultant—some of which were of general applicability and others related to the specific problems of individual countries—were those on the equipment and type of training needed and on the formulae and amounts of chemical substances required. He also advocated a number of studies and surveys as an essential prerequisite to the installation of fluoridation systems in the various countries.

Yemenite health workers complete training

The first ten citizens of Yemen to study health on an academic basis have successfully completed a year's training in sanitation and basic public health at the Hygiene Institute of Cairo, on WHO fellowships. Following this training, they received six weeks of practical instruction in quarantine measures under a special arrangement between the Governments of Yemen and Egypt.

On their return to Yemen in early October 1956, the newly trained health workers were assigned to posts in ports and principal cities: two were given work concerned with quarantine in the port of Hodeida, for example; and two others were attached to the staff of a new health centre, which is being established

by the Government (with WHO assistance), where they will form the nucleus of a medical service and assist international staff in various activities, including the training of new recruits.

Up until the present time, all medical work in Yemen has been done by foreign physicians, assisted by unskilled personnel. A number of Yemenite students are now studying medicine abroad on WHO fellowships, and will eventually take charge of health services and gradually replace the WHO personnel working in the country.

WHO fellowships for Indian professors

In September 1956, five professors from India went to the USA, as WHO fellows, to attend a specially designed course for teachers of preventive medicine. These professors are expected to return, in two years, to their country and act as heads of departments of preventive and social medicine in various medical colleges. The selection of the fellows was made, as usual, on the basis of recommendations by the Government.

The recipients of the special fellowship awards are: Dr D. K. Ramadwar, Reader in Preventive and Social Medicine, Medical College, Nagpur; Dr B. N. Lingaraju, Professor of Hygiene, Medical College, Mysore; Dr Rameshwar Sharma, Lecturer in Medicine, S. M. S. Medical College, Jaipur; Dr M. L. Chugh, Medical Officer of Health, Simla, East Punjab; and Dr S. Henry Moses, Assistant-in-Charge, Orientation Training Centre, Poonamallee, Madras.

Classification of snails

Malacologists, parasitologists, and specialists in snail-borne diseases such as bilharziasis may be interested to learn that efforts are being made to obtain some measure of international agreement on the nomenclature of the African freshwater snails *Biomphalaria* and *Bulinus*.

Dr G. Mandahl-Barth, of the Denmarks Akvarium, has prepared a draft manuscript in which he attempts to bring order into the present somewhat unsystematized taxonomy of these animals. The discrimination of species among the basommatophores has always presented considerable difficulty; environmental and age characteristics which might appear to be of systematic importance are generally valueless, while the true genital differences may be extremely difficult to distinguish. Many discrepancies of nomenclature have arisen during the past century because of lack of understanding of the variability of the different species, and misinterpretation of the original (sometimes very inadequate) description of the "type-specimen". Dr Mandahl-Barth, however, while referring continuously to the existing literature on the subject, has personally examined and noted the variations of particular anatomical and conchological characters in many thousands of snails originating from localities ranging widely over the African continent, and has compared not only specimens of different ages within the same population, but also adult specimens from as many populations of each form as possible. He has, moreover, made available to the reader much of the material on which his classification is based, in the form of abundant illustrations comprising enlarged photographs of three aspects of the shells, and detailed anatomical drawings made directly with the aid of a camera lucida.

The World Health Organization is now submitting the draft of Dr Mandahl-Barth's study to a number of malacological authorities in several countries for their criticism and suggestions, in the hope of arriving at an internationally acceptable classification of the Planorbidae. Should a reasonable measure of agreement be reached, it is intended ultimately to publish the study with the necessary amendments, in the expectation that it may serve as a guide through the intricacies of this subject for some time to come.

Public health work in the Americas

The Pan American Sanitary Bureau (WHO Regional Office for the Americas) has

published an account [1] of its history since it was first created in 1902 as a subsidiary organ of the then International Bureau of American Republics (later the Pan American Union). Dr Miguel E. Bustamante, the author, gives a comprehensive review of how the Bureau grew through more than half a century and expanded its activities until in 1954 it had emerged as a fully mature public health agency, moulded in its form by changing needs and gradually evolving ideas on the importance of public health.

He traces, too, the growth of wider international co-operation through the establishment of relations between the Bureau and such other health agencies as the Office International d'Hygiène Publique in Paris and the Health Section of the League of Nations, until it was agreed in 1949 that the Bureau should assume a dual role, by serving also as the regional organ of the World Health Organization in the Americas.

[1] *The Pan American Sanitary Bureau—Half a century of health activities, 1902-1954.* By Miguel E. Bustamante, Washington, D.C., 1955. (PASB Miscellaneous Publications No. 23). 101 pages. Available also in a 60-page Spanish edition. Gratis.

Review of WHO Publications

EPIDEMIOLOGY

Bulletin of the World Health Organization, 1956, Volume 15, No. 1-2.

In this issue of the *Bulletin* several studies have been brought together from various parts of the world dealing with differing aspects of epidemiology. The first three articles are the outcome of systematic international work in the collection of epidemiological and statistical data.

In 1952, M. Pascua reviewed the course, during the twentieth century, of mortality through cancer of the respiratory system as far as its spectacular rise up to 1949.[1] In 1955 that review was continued for the period 1949-52.[2] In the present issue, the same author reviews the trends of female mortality from cancer of the breast and genital organs for nineteen countries over the years 1920-53. Similarly, an article published in the *Bulletin* last year [3] gave the incidence of poliomyelitis throughout the world in 1953 and summarized the available reports on the virus types responsible for outbreaks in recent years. In the second article of the issue a comparable statistical and virological study of poliomyelitis in 1954 has been prepared by A. M. M. Payne and M. J. Freyche. A third article by S. Swaroop, R. M. Albrecht and B. Grab analyses the statistics on mortality from accidents among children.

Two other papers in this issue illustrate a different type of epidemiological study undertaken by WHO, namely: the surveys organized in various parts of the world for the collection of fresh epidemiological material on diseases whose prevalence is still largely a matter of conjecture in certain areas. The first of these two papers, on protein malnutrition, is the third in a series of important surveys on this condition. J. Waterlow and A. Vergara deal with the problem in Brazil.

The article which follows is Dyson M. Blair's survey on bilharziasis in British West and East Africa, Nyasaland and the Rhodesias. This constitutes the sixth in a series of

[1] Pascua, M. (1952) *Epidem. vital Statist. Rep.*, **5**, 1
[2] Pascua, M. (1955) *Bull. Wld Hlth Org.*, **12**, 687
[3] Freyche, M. J., Payne, A. M. M. & Lederrey, C. (1955) *Bull. Wld Hlth Org.*, **12**, 595

studies published in the *Bulletin* since 1954 describing the epidemiology of this disease in the African and Eastern Mediterranean regions.

The contribution by M. Likar and J. Kmet on virus meningo-encephalitis in Slovenia is representative of a third type of epidemiological work, namely: studies undertaken by research workers in national laboratories but co-ordinated internationally by WHO. The particular instance appearing here is part of a series on this tick-borne disease, the first three of which appeared last year. This disease has only recently been recognized in Central Europe, although it may have been present for many years. It is of particular interest at the present time since it may easily be confused with poliomyelitis.

Finally, another type of study is represented by epidemiological papers giving results obtained entirely with national or private resources on diseases of extensive geographical distribution and believed to be of widespread interest. This number contains several examples of such studies, either solicited by WHO or spontaneously offered by their authors for publication. They come from the USA, Yugoslavia, Hungary, Czechoslovakia and Turkey, and deal with such subjects as botulism, viral and rickettsial infections, goitre, the role of birds in the spread of Q fever, and poliomyelitis.

The number also contains a Bibliographical Section, giving reference to material published within approximately the last year on cholera and yellow fever. This feature, which is published from time to time in the *Bulletin*, is designed to give as complete coverage as possible of recent publications on these and other quarantinable diseases.

CORRIGENDA

Vol. 10, No. 9-10

DISEASE CONTROL AND INTERNATIONAL TRAVEL

Page 281, right-hand column, second paragraph, line 1
delete companies
insert countries

Vol. 10, No. 11

Page 379, right-hand column, third paragraph, lines 10 and 11,
delete £
insert $

Page 390, left-hand column, MALARIA FIELD APPOINTMENTS, line 2, name should read:
Dr S. Roy Chowdhury

World Health Organization: Monograph Series No. 33

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" Since the dawn of history, man has had to match his wits against two-, four-, and six-legged adversaries in a struggle for existence. Once upon a time, when he won these contests, he ate as much of his opponent as he could stomach." Today, the idea of eating meat in so crude and indigestible a form is abhorrent to most people; with the development of agriculture and animal husbandry, however, mankind has come " to depend increasingly for strength and sinew upon the cooked flesh of tamed herbivores ". But the widespread use of such animals for food has brought in its train many problems. Meat is a perishable commodity and its poor handling, whether by the slaughterer, the retailer, or the housewife, is likely to result in ill health and wastage. The farmer, too, has a part to play in providing the consumer with safe and wholesome meat: he is responsible for the health and care of the animals before slaughter.

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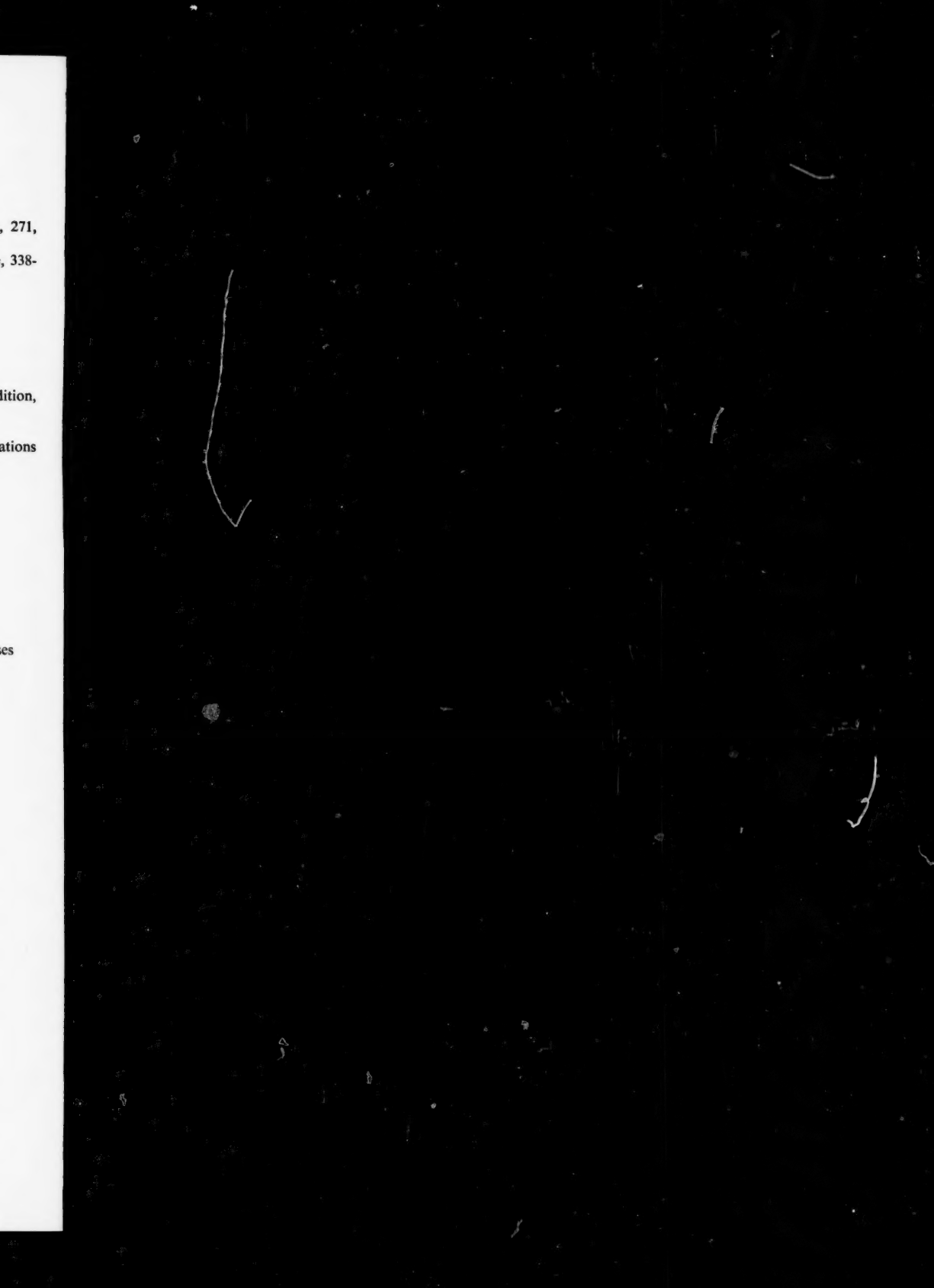
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